Application Number	Application for (a-urban, b-agriculture, c-DWR/WUE:
153	a) Prop 13 Urban Water Conservation

Principle Applicant(Organization/Affiliation)

Fair Oaks Water District

Project Title

Residential Plumbing Retrofit

First Name-Authorized	Last Name (AA):	Title
Michael	Cobb	Water Conservation Coordinator

Street Address	PO Box
10317 Fair Oaks Blvd.	
City	State
Fair Oaks	CA
Zip Code	Telephone Number(Include Area Code)
95618	(916) 967-5723
Fax Number (Include Area Code)	E-mail Address
(916) 967-0153	mcobb@fowd.com

First Name-Contact Per	Last Name-CP:	Contact-Title

Contact-Street Address	Contact-PO Box
Contact-City	Contact-State
Contact-Zip Code	Contact-Phone Number
Contact-Fax Number	Contact-E-Mail Address

Funds Requested (dollar amount	Applicant Funds Pledged (dollar amount	Total Project Costs (dollar amou
$8,804.00	$8,804.00	$17,608.00

Estimated Total Quantifiable Project Benefits (dollar amount	Percentage of Benefits to be Accrued by App
$24,875.00	1
Percentage of Benefits to be Accrued by CALFED or othe	Estimated Annual Water to be Saved (acre-fe
0	276
Estimated Total Amount of Water to be Saved (acre-fee	Over _____ Number of Years
1108	6

Estimated Benefits to be Realized (terms of water qual,instream

reduced demand

Duration of Project (month/year-month/year):	State-Wide
02/02-12/04	☐

State Assembly District-location of project(	5	State Senate District-location of project(1	6
State Assembly District-location of project(		State Senate District-location of project(2	
State Assembly District-location of project(		State Senate District-location of project(3	
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State Assembly District-location of project(		State Senate District-location of project(9	
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Congressional District(s)-location of project	3	Congressional District(s)-location of project(	
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Congressional District(s)-location of project		Congressional District(s)-location of project(1	

County-location of project	Most recent Urban Water Mgt Plan Submitt
Sacramento	1/1/1998

Type Applicant-Urban(a)Agricl Feas Study(b) Gra	DWR WUE Projects	Project Focus
	h) Non-Profit Organization	b) Urban

Project Type:

a) Implementation of Urban Best Management Practices

Quantifable Objectives

Specify from choice (d) above

Specify from (k) above

Does Proposal involve change in land use (planned/future)ICheck box if yes

☐

March 01, 2002
Fair Oaks Water District
WUE 2002 Proposal
Urban Best Management Practices
Residential Plumbing Retrofit
PROPOSAL PART TWO

Project Summary

Fair Oaks Water District is located within the Sacramento County of Northern California 20 miles due east of Sacramento just off of California Highway 50. The District is looking to increase public awareness of water conservation through the direct delivery of 1,100 residential plumbing retrofit kits during the same time that there is an upgrade of District main lines and installation of meters for the time frame from 2002 – 2004. Costs are for the residential plumbing retrofit kit materials and labor for packaging said kits, not including delivery due to multiple tasking during notification to residents of coming upgrades and meter installation. The areas that are being upgraded during this time frame are homes that were built prior to 1980. Amount of water to be saved is estimated between 276 –138 AF/yr (50% - 100% - retrofit kit installation) upon completion of the three year project is estimated a savings of $24,875 – $12,438/year for the purchase of water from a wholesaler at the current rate applied. Projected residential retrofit plumbing kits total cost are identified at $17,105 ($15.55/per kit) and total labor costs at $503.00 ($16.00 per/hour) in ordering, handling and packaging.

A. Scope of Work: Relevance and Importance

A.1. The nature of the project is to implement a supplement to the already conservation program by a direct public relations package that will support Best Management Practices (BMP) Two (2) "Residential Plumbing Retrofit" via plumbing retrofit kits. These kits will be provided directly to 1,100 affected homes during pipeline replacement projects and meter installation within the next three years (2002-2004). This front end approach will reinforce not only the message of upgrading for the main lines and service lines within affected areas as being done not only for stability, reliability but that within the message comes with it that conservation is a part of the bigger picture helping to ensure increased service line longevity. This is accomplished through conservation by reducing demand on the system as a whole over the up and coming years.

A.2. The District (recipient of Bureau of Reclamation (BOR) (Folsom Lake) treated surface water via a wholesaler) is a signatory of Water Forum Agreement and signatory also with a Memorandum of Understanding with California Urban Water Conservation Council (CUWCC). Support of the BMPs 1-14 is mandated for water purveyors that receive water from contracting through the BOR. There is a Water Conservation Coordinator assigned full time along with a full time Water Conservation Specialist implementing a water conservation program that is proactive in the conservation of water through implementation of BMPs which is consistent with the message within the Sacramento Valley Region via Sacramento Area Water Works Association (SAWWA) and the Regional Water Authority (RWA) of which Fair Oaks Water District is a member as a strong

B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring and Assessment

B.1. Materials will be ordered to satisfy projected installation schedule set by the maintenance department, that is what will drive the delivery of the residential plumbing retrofit kits to the customers. This method is low tech such that the crews will identify the number of services and meters to be installed on a weekly basis due to varying workloads and external circumstances that are out of control of the District's hands. Retrofit kits will be available to be picked up off of the shelf during the preparations for daily and weekly work schedules.

B.2. The District at present time has scheduled within long term to replace 350 services and meter installation for 2002, 2003 with 400 the projected number of meters and services in 2004. In the year 2001 the District installed over the scheduled 300 meters for installation by 100. In preparation for projects, all materials will be ordered at one time to fulfill and satisfy for that year. The residential plumbing retrofit kits will be assembled with both materials and bags, packaged together and placed on the shelf for ease and access.

See Appendix B.2-1 for Schedule and Appendix B.2-2 that identifies costs expenditures.

B.3. Due to initial metering installation, there is no historical data that is available for comparison for consumption before installation of water saving materials. A survey letter will be provided to each customer after completion of each area project to determine success in installation of the materials that were provided in the residential plumbing retrofit kit. Data will be maintained within a District data base that is used for each customer account to identify when the installation of the meter took place, providing of the plumbing retrofit kit and the response from the customer. Included in initial letters to the customer of notification of installation of the meter, there is an offer to assist in the installation of the water saving materials and also performance of a landscape irrigation survey at no additional charge.

B.4. There are no plans or specifications or certification statements required to implement the residential plumbing retrofit program.

C. Qualifications of the Applicants and Cooperators.

C.1. See Appendix C.1-1

D. Benefits and Costs.

D.1. For capital outlay project proposals (Prop 13 Urban Grants)

a. Land Purchase/Easement – Not applicable

b. Planning/Design/Engineering - Not applicable
c. Materials/Installation – - See Appendix D.1-1 for Purchases
d. Structures – Not applicable
e. Equipment Purchases / Rentals Not applicable
f. Environmental Mitigation / Enhancement – Not applicable
g. Construction / Administrative / Overhead – Not applicable
h. Project / Legal / License Fees -– Not applicable
i. Contingency (up to 15%, amount must be fully justified by applicant) - Not applicable
j. Other - – Not applicable

D.2. Fair Oaks Water District proposes to cost share the residential plumbing retrofit kit program at a 50 / 50 split of responsibility with DWR. The cost only addresses materials and labor for the preparation of ordering and putting together the residential plumbing retrofit kits. The cost does not include the delivery of or customer assistance in installation of the residential plumbing retrofit kits.

See Appendix D.2-1 for the combined costs for the full project.

D.3.a Quantify project outcomes and benefits. Not Applicable

D.3.b The outcome of the project is not be able to be quantified due to the absence of initial consumption data prior to the installation of meters and water saving materials with the uncertainty of what percentage of residential plumbing retrofit kits will be utilized and what percentage of each kit utilized will be installed. It is the hope of the Fair Oaks Water District Water Conservation Department that the utilization of the provided materials will bring forth to our customers an increased level of awareness that conservation is not too difficult when one is provided free of charge amenities that will provide such an outcome of water savings. The carry over from the inside of the home to the outside landscape irrigation will also benefit with this heightened awareness of conservation. In the past there has been an offer of internal and external home water conservation survey and the response has been anything but stellar. The installation of meters is unfortunately looked at as an invasion of privacy and intrusion in to ones life by the government. This direct approach of here are the materials, please respond and act accordingly as a responsible home owner. Try some of these items that are provided and you will be pleasantly surprised. It is supplying a positive attitude and image to our customers that hopefully will win them over. For $15.55 a kit, it is worth a try and as they say, “We are the Government and we are here to help you”.

D.4.a In determining savings for the installation of residential plumbing retrofit kits, I turned to the *Handbook of Water Use and Conservation* by Amy Vickers, published May of 2001. Within the book were several tables that identified

estimated water use and savings "Low-volume shower heads in house holds", table 2.11; and "Low-volume faucets in households", table 2.15. Both tables provided invaluable data of several categories such as water use rate, frequency of use, estimated water savings with a 2.5 gpm or a 1.5 gpm device including per house hold, per capita in day or year. There were three eras represented by all of the usage date and those were 1994-present, 1980- 1994, and Pre-1980. The area where the residential plumbing retrofit kits are being offered are all Pre-1980 and typically have two bathrooms i.e., two toilets, two vanities, and two showers and a typical one kitchen. This made the calculation somewhat simple from each table in calculation of water savings. The application of a toilet displacement device, the toilet bag was chosen over the toilet dam due to ease of installation and change out. The displacement capacity was identified in the AM conservation catalogue. Unfortunately the probability of 100% of all residential plumbing retrofit kits is highly unlikely. The *Handbook of Water Use and Conservation* identifies that there is a 50% to 75% on average installation rate for retrofit kits.

See Appendix D.4 a–1, D.4.a-2, D.4.a-3 and D.4.a-4 for calculations applied to savings and costs.

D.4.b The Handbook of Water Use and Conservation identifies that there is a 50% to 75% on average installation rate for retrofit kits. Taking these percentages, See Appendix D.4.b-1 for a comparison of savings in water.

D.4.c Conversion of all costs and benefits to their present value and equivalents prior to aggregating them using a six percent discount rate can be reviewed in Appendix D.4.c-1.

D.4.d The only projected benefit is a cost savings in water that is shown to present a value in savings only to the Fair Oaks Water District. See Appendix D.4.b-1.

D.4.e. In review of the benefit to cost ratio, it is initially dependent on what approach one takes as to the percentage of residential plumbing kits that are utilized. At the worse case scenario by year there is a water savings from year two on that the benefit to cost ration is greater than one when compounding savings from the year before with out the materials and labor cost to add on as identified by reviewing Appendix D.4.a-4.

E. Outreach, Community Involvement and Acceptance – Not applicable due to the nature of timing with upgrading of infrastructure of the District. Areas to be upgraded are identified within the Districts newsletter "Water Currents" that is mailed to all customers.

2002-2004 **Scheduled Installation of Residential Plumbing Retrofit Kits**

Year	2002	2003	2004
Quarter	Number of Meters Scheduled	Number of Meters Scheduled	Number of Meters Scheduled
First	45	45	60
Second	130	130	140
Third	130	130	140
Fourth	45	45	60
Total For Year	350	350	400

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2002-2004 Expenditurers on Materials and Labor Scheduled

Year	2002		2003		2004	
Quarter	Labor	Materials	Labor	Materials	Labor	Materials
First	$160	$5,443	$160	$5,443	$183	$6,220
Second	$0	$0	$0	$0	$0	$0
Third	$0	$0	$0	$0	$0	$0
Fourth	$0	$0	$0	$0	$0	$0
Semi Total	$160	$5,443	$160	$5,443	$183	$6,220
Yearly Total	$5,603		$5,603		$6,403	

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Residential Plumbing Retrofit Kit Pricing

Item	Nomenclature	Quanity	Cost per item	Total Cost
1	Aerator, bathroom (1.5 GPM)	2	$0.39	$0.78
2	Aerator, kitchen (2.2 GPM)	1	$1.79	$1.79
3	Bathroom shower head (2.2 GPM)	2	$4.13	$8.26
4	Dye Strips (2)	1	$0.19	$0.19
5	Flapper (1)	2	$1.25	$2.50
6	Toilet tummy (0.625 GPF)	2	$0.69	$1.38
7	Kit plastic carry bag	1	$0.65	$0.65

INDIVIDUAL KIT PRICE	$15.55

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2002-2004 Over view of Residential Plumbing Retrofit 100% Installation Kits 1100

Acre Feet (AF)

Homes	**Aerator** savings per year in gallons	Baths	Kitchen	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
1100	18,212	2	1	54,636	60,099,600	**184**	**$16,600**
Homes	**Shower** savings per year in gallons		Shower	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
1100	13,619		2	27,238	29,961,800	**92**	**$8,275**

Total AF Saved	Total Savings
276	**$24,875**

Labor $$

Kits	Assembly per hour	Hours Expended	Labor Cost/hr	2002 Labor costs
1100	35	31	$16.00	**$503**

Residential Plumbing Retrofit Kits $$

Kits	Cost per kit (see worksheet Kit Prices)	2002 Project Cost
1100	$15.55	**$17,105**

Acre Feet Savings $$	**$24,875**
Labor & materials costs	**$17,608**

Savings in Dollars	**$7,267**

Savings in Acre Feet	**276**

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2002 Residential Plumbing Retrofit Kits 350

Acre Feet (AF)

Homes	**Aerator** savings per year in gallons	Baths	Kitchen	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
350	18,212	2	1	54,636	19,122,600	**59**	**$5,282**
Homes	**Shower** savings per year in gallons		Shower	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
350	13,619		2	27,238	9,533,300	**29**	**$2,633**

Total AF Saved	Total Savings
88	**$7,915**

Labor $$

Kits	Assembly per hour	Hours Expended	Labor Cost/hr	2002 Labor costs
350	35	10	$16.00	**$160**

Residential Plumbing Retrofit Kits $$

Kits	Cost per kit (see worksheet Kit Prices)	2002 Project Cost
350	$15.55	**$5,443**

Acre Feet Savings $$	**$7,915**
Labor & materials costs	**$5,603**

Savings in Dollars	**$2,312**

Savings in Acre Feet	**88**

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2003 Residential Plumbing Retrofit Kits 350

Acre Feet (AF)

Homes	**Aerator** savings per year in gallons	Baths	Kitchen	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
350	18,212	2	1	54,636	19,122,600	**59**	**$5,282**
Homes	**Shower** savings per year in gallons		Shower	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
350	13,619		2	27,238	9,533,300	**29**	**$2,633**

Total AF Saved	Total Savings
88	**$7,915**

Labor $$

Kits	Assembly per hour	Hours Expended	Labor Cost/hr	2003 Labor costs
350	35	10	$16.00	**$160**

Residential Plumbing Retrofit Kits $$

Kits	Cost per kit (see worksheet Kit Prices)	2003 Project Cost
350	$15.55	**$5,443**

Acre Feet Savings $$	**$7,915**
Labor & materials costs	**$5,603**

Savings in Dollars	**$2,312**

Savings in Acre Feet	**88**

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2004 Residential Plumbing Retrofit Kits 400

Acre Feet (AF)

Homes	**Aerator** savings per year in gallons	Baths	Kitchen	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
400	18,212	2	1	54,636	21,854,400	**67**	**$6,036**
Homes	**Shower** savings per year in gallons		Shower	Gallons saved per household	Gallons / year	AF Saved	Reduced monetary expenditurer
400	13,619		2	27,238	10,895,200	**33**	**$3,009**

Total AF Saved	Total Savings
100	**$9,045**

Labor $$

Kits	Assembly per hour	Hours Expended	Labor Cost/hr	2004 Labor costs
400	35	11	$16.00	**$183**

Residential Plumbing Retrofit Kits $$

Kits	Cost per kit (see worksheet Kit Prices)	2004 Project Cost
400	$15.55	**$6,220**

Acre Feet Savings $$	**$9,045**
Labor & materials costs	**$6,403**

Savings in Dollars	**$2,643**

Savings in Acre Feet	**100**

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2002-2007

Tiered Costing Water vs Labor of Residential Plumbing Retrofit Installation

Kits 1100

Year	Kits Installed	Water Costing Savings 100% Kit Installation	Water Costing Savings 75% Kit Installation	Water Costing Savings 50% Kit Installation	Materials & Labor Cost	Costing Savings 100% Kit Installation	Costing Savings 75% Kit Installation	Costing Savings 50% Kit Installation
2002	350	$7,915	$5,936	$3,957	$5,603	$2,312	$334	-$1,645
2003	350	$7,915	$5,936	$3,957	$5,603	$2,312	$334	-$1,645
2004	400	$9,045	$6,784	$4,523	$6,403	$2,643	$381	-$1,880
2005	0	$24,875	$18,656	$12,437	0	$24,875	$18,656	$12,437
2006	0	$24,875	$18,656	$12,438	0	$24,875	$18,656	$12,438
2007	0	$24,875	$18,656	$12,438	0	$24,875	$18,656	$12,438

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2002-2007 **Tiered Savings 100%, 75%, 50% Kit Installation Success** **Kits 1100**

Year	Kits Installed	Water Costing Savings Kit Installation 100%	Water Costing Savings Kit Installation 75%	Water Costing Savings Kit Installation 50%	Acre Feet Savings (AF) 100%	Acre Feet Savings (AF) 75%	Acre Feet Savings (AF) 50%	Compounded Yearly Project Acre Feet Savings (AF)		
								100%	75%	50%
2002	350	$7,915	$5,936	$3,957	88	66	44	88	66	44
2003	350	$7,915	$5,936	$3,957	88	66	44	176	132	88
2004	400	$9,045	$6,784	$4,523	100	75	50	276	208	138
2005	0	$24,875	$18,656	$12,437	276	207	138	276	207	138
2006	0	$24,875	$18,656	$12,438	276	207	138	276	207	138
2007	0	$24,875	$18,656	$12,438	276	207	138	276	207	138

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Fair Oaks Water District

Present Value of Plumbing Retrofit using 6%

In 2002 dollars		
	Labor	Materials
2002	160.00	5,443.00
2003	160.00	5,443.00
2004	183.00	6,220.00
	503.00	17,106.00

Present Value Equivalents		
6.00%	Labor	Materials
2002	160.00	5,443.00
2003	150.94	5,134.91
2004	162.87	5,535.78
	473.81	16,113.68

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Fair Oaks Water District, Sacramento CA (1999-present)- ***Water Conservation Coordinator*** performing day to-day operations of the District's conservation program, water usage, and conservation records management. A representative and liaison to various water agency management and conservation organizations such as SAWWA and RWA. Responsible for any seasonal conservation patrol and audit program, which includes direct supervision of temporary conservation personnel or other assigned team members, and monitoring of customer's records pertaining to water waste.

Department of The Army (civilian**)**, Redstone Arsenal, AL. (1995-1999) – ***Health Physicist*** assigned to the us Army personnel dosimetry operations and records management center. Team Leader within the Central Dosimetry Records Repository including over site of technical responsibilities, administrative duties and primary liaison interfacing with contracted Database Manager. Internal auditor addressing manpower allocations, work practices, work paths, cost analysis of equipment and contracting. Directed legal record documentation from paper to electronic formats databases with report consolidation update capabilities. Enacted process action team applications to solve production problems.

Department of the Navy (civilian**), MARE ISLAND NAVAL SHIPYARD**, Vallejo, Ca (1977-1995)

1991-1995 ***Health Physicist*** Provided radiological engineering and technical guidance in the arena of mixed and hazardous waste from "cradle to grave". Liaison to six U.S. Naval vessels in the Pacific Corridor in relation to radioactive and mixed waste. Project Team Leader identifying cost reduction operations increasing waste disposal productivity three-fold. Technical representative (back shift) working in conjunctions with other technical codes and shops (welder, ship fitters, electrical, support facilities, ships force) to provide resolutions and technical guidance to planned and unforeseen emergent situations to support the mission and maintain schedule.

1987-1991 ***Radiological Controls Technician****:* Radiological Controls Technician Supervisor, trainer in instrumentation, job coverage and oral board skills including response for radiological incidents and nuclear reactor accidents from the technician level to first line supervisor (immediate responders). Assigned as a part of the management tea supporting the Emergency Control Center (ECC). Responsibilities encompassed data collection, sheltering, evacuation, and response for emergency personnel (fired, ambulance, repair teams, survey teams) and contact with local, state and federal agencies. Collateral duties as a facilities coordinator interfacing with civil, mechanical, electrical engineers, and architects during transformation of a Coast Guard Station and plating shop into a pristine radiological training facilities. Designed and directed fabrication of training mockups (welders/pipe fitters/ship fitters/sail makers).

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1981-1987 ***Engineering Technician:*** Technical authority for maintenance, repair and design of nuclear facilities and special purpose handling equipment. Generated procedures for manufacturing, repair and certification of support equipment along with nuclear facilities interfacing with the end user during process. Representative at Plan of the Day during critical refueling / defueling periods interfacing at all levels within organizations and teams. Perform audits on plans, trade procedures; analyze and evaluate identified facility and equipment deficiencies providing resolutions.

1979-1981 ***Heavy Mobile Equipment Mechanic Apprentice:*** Performance of maintenance, trouble shooting and operations related to heavy mobile equipment such as trucks, trailers, cranes (i.e. bridge/gantry), fork lifts, yard locomotives, Caterpillar and John Deere construction equipment and diesel/gasoline engines.

1977-1979 ***Radiological Controls Technician:*** Support position to ensure that compliance remained within established guidelines and procedures concerning radiological, health and safety issues. Specifically, I the overhaul, refurbishment and operational testing of Naval Nuclear Power submarine propulsion plants, their associated support equipment and nuclear support facilities (waste and water processing). Authority to stop unsafe or questionable non-standard procedural conditions providing recommendations to cognizant technical authority. Radiation detection equipment utilized. Scene leader for radiological casualty episodes.

Department of the Navy (enlistment) 1970-1976): Nuclear propulsion certification program (years), classification as a Marine Machinist with operational experience (4 years) encompassing a multitude of reactor support station and various skill levels through Nuclear Propulsion Plant Watch Supervisor. Duties included reactor complex operations (primary/secondary), over site of training (operations, theory, maintenance, causalities), propulsion equipment controller and drill/auditor team member.

Education: U.S. Navy Machinist Mate A school, nuclear power and prototype, two and a half years in an engineering undergraduate degree program, Hazardous Waste and Environmental Auditor Certificates (U.C. Davis). Water Conservation Practitioner Level I, Certified Landscape Irrigation Auditor.